

Clashing on Social Media: Exploring the Impact of Twitter Banter Among Competing Fast-Food Brands

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This study quantifies the causal effects of viral banter on social media among rivals in the context of a new product launch by a focal brand. Such banter might not only increase user engagement but also have a substantial sales impact on the brands involved. The analysis shows that the viral banter caused a 426% jump in online searches and led to a 54% increase in offline sales for the focal brand. Although the rival brands also benefited from increased user

engagement, they did not experience a significant change in online search and offline sales. Beyond the initial success, focal brand sales sustained long-term growth (30%). These findings imply that brands should exercise caution before disparaging their competitors on social media.

Keywords: brand-to-brand communication, social media, new product introduction, causal inference

Brands increasingly employ playful dialogue to interact with their competitors on social media, notably on platforms such as Twitter (now X). This trend involves brand-to-brand communication characterized by witty and occasionally cheeky exchanges. Thomas and Fowler (2021) conceptualized the term “brand-to-brand dialogue” to emphasize the exchange of sarcastic and occasionally impertinent comments between brands (e.g., Taco Bell vs. Old Spice, Kit Kat vs. Oreo) (Patnode, 2023). In these interactions, brands adopt human-like personas, using humor and contemporary language to engage their audiences. While the landscape has shifted online, such witty exchanges were previously prevalent in offline settings through billboard confrontations and comparative advertising¹. Such dialogue captivates audiences (Greene et al., 2022) and has the potential to swiftly reach broader audiences—

¹ In comparative advertising, firms compare their products and services directly with those of competitors (e.g., Cox, 2017).

or, in social media terms, “go viral.” In this study, we term these impromptu exchanges on Twitter among brands, akin to human banter and captivating millions of users, as “online banter.” Brand banter on social media platforms, when infused with human-like tones, extends its reach through retweets, expanding audience outreach and engaging broader social media communities (Greene et al., 2022; Lee et al., 2018; Pishko, 2019; Tuten & Solomon, 2017). Specifically, during new product launches, such banter can target potential customers of the involved brands (Gruner et al., 2019; Hultink & Robben, 1995), enhancing awareness of the new products. Consequently, online banter has the potential to influence the businesses of these brands.

This study analyzes the dynamics of such banter and measures its impact on offline sales within the context of new product launches. We establish a potential mechanism to explain the observed effect and eliminate the possibility of the effects resulting from strategic marketing decisions by the brands. The findings reveal that banter not only affects short-term sales but also yields a lasting impact. To our knowledge, this study is the first to employ quasi-experimental data to quantify the impact of social media banter on sales. The study carries substantial implications for social media managers who engage in impromptu banter with rival brands.

EMPIRICAL CONTEXT

We investigate an instance of social media banter among brands, initiated by Chick-fil-A following the nationwide release of a spicy chicken sandwich by Popeyes Louisiana Kitchen on August 12, 2019. One week after the launch on August 19, Chick-fil-A humorously targeted Popeyes' new sandwich with a cleverly worded tweet from its official Twitter account. Wendy's then joined in, critiquing both Popeyes and Chick-fil-A sandwiches. Popeyes promptly responded to both rivals within hours, using trendy language familiar to its loyal African American customer base (e.g., “y’all good?” “y’all looking thirsty”; Chatelain, 2019). Figure 1 displays the tweets sent by the three brands on August 19, 2019. Notably, this online banter resembles comparative advertising (e.g., Grewal et al., 1997; Shaffer & Zettelmeyer, 2009) typically employed in traditional media channels (outdoor, television, and print). However, the two settings have an important distinction. Comparative advertising operates within planned marketing campaigns,

which makes it endogenous, whereas online banter is spontaneous and not part of a planned marketing strategy. Furthermore, the banter among the rivals happened one week after a new product launch, which allows us to separate the effect of Twitter banter from the product launch effect. Consequently, we aim to address the following research questions:

RQ1: Does banter among competing brands on social media affect a focal brand's sales during a new product launch? Moreover, how does this banter affect the sales of its rivals?

RQ2: What are the short- and long-term impacts of banter among competing brands on social media? Which factors might moderate the effect of banter?

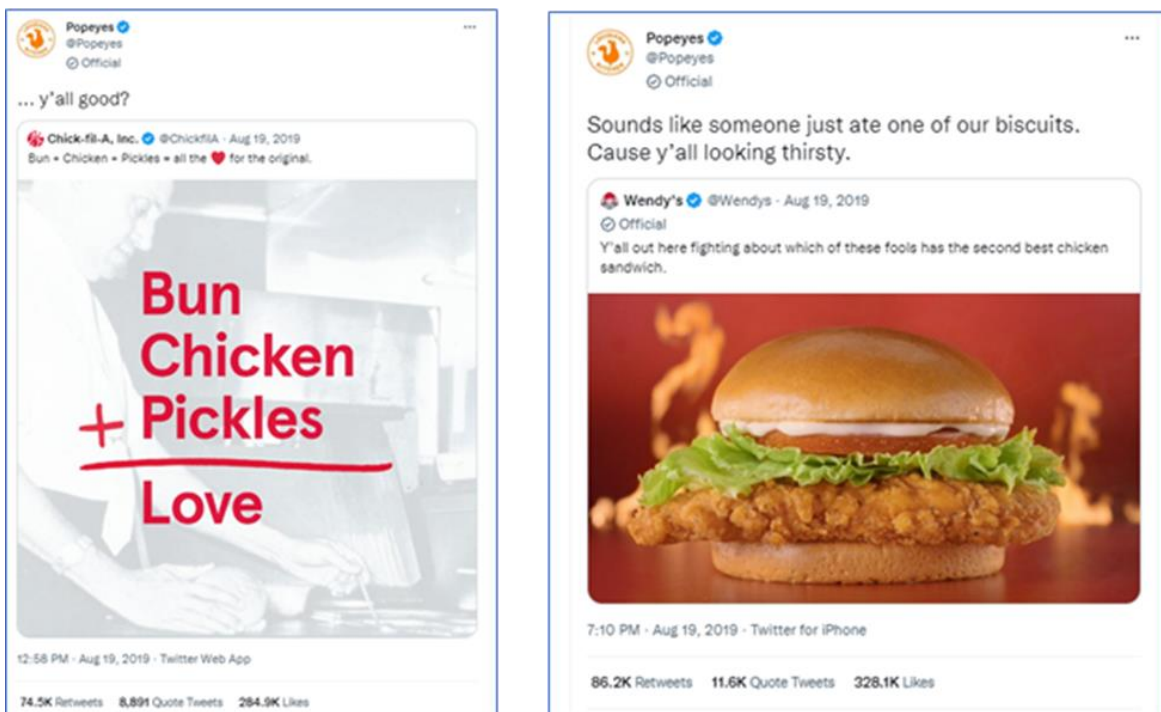


Figure 1. Twitter Banter among Popeyes, Chick-fil-A, and Wendy's.

LITERATURE REVIEW

Brand-to-brand interactions have long been prevalent in offline settings, and their effects have been investigated by marketing scholars. For example, the famous cola wars between Pepsi and Coke featured an enduring competition over taste preference (Yoffie & Wang, 2002). Similarly, a notable offline brand confrontation occurred during the

“billboard wars” between BMW and Audi in Los Angeles. These brands engaged in a witty exchange through strategically placed billboards (Ensha, 2009). In offline settings, brands also adopt comparative advertising to engage with competitors. For example, the rivalry between Apple and Microsoft unfolded through a series of such advertisements (Cox, 2017). Similarly, McDonald's and Burger King engaged in banter through billboard ads, specifically comparing the quality and distance of stores (Dura, 2020). Marketing literature extensively covers comparative advertising, highlighting its significant impact on consumer perceptions, advertising effectiveness, and behavioral intentions (Grewal et al., 1997; Sorescu & Gelb, 2000). According to Grewal et al. (1997), direct comparisons in advertising can be more attention-grabbing and effective in enhancing brand awareness than non-comparative ads. However, negative comparisons, as often appearing in political campaigns and comparative advertising, can lead to backlash and lower advertisement evaluations (Garramone, 1984; Grewal et al., 1997; Merritt, 1984; Sorescu & Gelb, 2000). Parodic advertising, employing humor and satire, might negatively affect brand recall and attitudes toward the sponsoring brand (Roehm & Roehm, 2014). Shaffer and Zettelmeyer (2009) use game-theoretical models to explain the conditions under which firms might use comparative advertising and portray rivals negatively. Barigozzi et al. (2009) examine the use of comparative advertising by a newcomer with unknown quality to signal its product quality to an established competitor with known quality.

In the realm of online brand communication, Thomas and Fowler (2021) discuss brand-to-brand dialogue, a phenomenon characterized by sarcastic and sometimes abrasive exchanges between brands. This context differs from that in marketing literature, which frequently focuses on social media interactions between brands and consumers (e.g., Colliander et al., 2015; Simon & Tossan 2018). It also diverges from comparative advertising, in which brands implicitly or explicitly compare themselves with rivals without eliciting a spontaneous response from those brands. Social media enables real-time brand dialogue (Hennig-Thurau et al., 2010), uniquely allowing immediate and direct responses. In social media settings, such exchanges between brands are sought after by social media users (Sprout Social, 2017) and are considered an objective in certain brand-to-brand interactions (Jargon, 2017). Zhou et al. (2022) propose that brand banter on Twitter, particularly when offering praise or reflecting a brand's persona, can heighten

consumer engagement (Pishko, 2019). Greene et al. (2022) also emphasize the positive impacts of brand banter on Twitter, such as increased consumer engagement and the ability to share content to a wide audience. Conversely, Thomas and Fowler (2021) show that using disparaging humor in brand banter can lead to negative attitudes toward the initiating brand.

The current study distinguishes online banter from other brand conflicts, highlighting the critical role of timeliness, especially during a new product launch. We demonstrate that brand banter during a new product launch can significantly boost consumer engagement and directly influence sales, a novel finding previously undocumented in the literature.

An important feature of the banter examined herein is its occurrence during the launch of a new menu item by one of the involved brands. New menu items are part of key marketing activities, such as pricing, branding, and advertising (Hardy, 2019), and often attract attention from brand rivals. These innovations frequently manifest as brand extensions, such as Chick-fil-A's pasta, or line extensions, such as KFC's meatless burger (Hariharan et al., 2015; Kadiyali et al., 1998). Competitors in the fast-food industry pursue these extensions to drive sales with minimal risk and investment (Quelch & Kenny, 1995). Scholars have examined the fast-food sector from various angles. For example, Shen and Xiao (2014) analyze McDonald's and KFC's entry into China and their mutual impact on expansion. Gottfredson and Aspinall (2005), in a study similar to ours, use the fast-food industry to illustrate how menu complexity affects profitability. New product launches are a vital strategy for fast-food brands to attract customers and bolster profits.

Data

We use a footfalls dataset as a proxy for sales to capture the impact of banter on a firm's sales. In the fast-food industry, footfalls are highly correlated with sales and thus are a good indicator for changes in sales. We also use Google search trends data to elaborate on the potential mechanism for the observed effect.

Footfalls Data. Footfalls (visits) data come from SafeGraph, a firm that collects anonymized location data from users who consent to smartphone location tracking. Overall, SafeGraph tracks 45 million panelists, which represent roughly 10% of active

smartphones in the United States. The company also tracks visits to a particular store or business by mapping the panelist's location (latitude and longitude) to a comprehensive database of establishments (e.g., gas stations, retail stores, restaurants). The data consists of total visits to each establishment aggregated by day and visitors' data aggregated by week. We focus on visits (and visitors, or the number of unique individuals whose behavior is tracked) between January 2018 and February 2020 (before the COVID-19 lockdowns began). SafeGraph implements various checks to mitigate issues of selection bias.

To obtain a stable sample to account for changes in the number of panelists during the time frame, we used an inflation factor (Gurun et al., 2020) constructed at the state level to de-trend the data. We first find the total number of visits across all establishments aggregated by each state in the last week of February 2020 (v_T). With the total number of visits across all establishments in each week (v_t), we then scale the visits to a given store using the factor (v_T/v_t). All three brands in our analysis (Popeyes, Chick-fil-A, and Wendy's) have a significant presence in more than 90% of the states, and SafeGraph covers nearly 92% of all store locations of these brands.

Google Search Data. Google Trends data show whether the brand banter caused a change in online searches for these brands. In particular, they indicate the popularity of search queries on Google across different geographic areas, following the banter. This website provides a time series index of the volume of search queries within an area based on query shares (total query volume for a search term within a particular geographic region divided by the total number of queries in that region during a desired time frame). The maximum query share in the period is normalized to 100. Given our research questions, we collected data before and after the banter for Popeyes, Chick-fil-A, and Wendy's to analyze changes in search trends.

Mechanism

Our primary objective is to quantify the direct effects of brand banter on offline sales; also instructive is to determine which factors mediate these effects. Prior research has shown that social media content (e.g., blogs, forums) is associated with Google search queries (Eskandari et al., 2019). Popular tweets by brands and personalities (The Ed Show, 2012) that generate buzz in online communities attract online search interest. Thus, we anticipate that in our case, the viral Twitter banter should influence online

search interest. We leverage Google Trends data to illustrate the surge in online search prompted by the banter. Banter was followed by high Twitter activity, as analyzed in the appendix. Subsequently, drawing from existing literature, we infer a positive correlation between online search behavior and offline sales, a relationship supported by multiple studies. For example, Kim and Hanssens (2017) demonstrate the impact of blog postings and keyword search volume on post-release box office revenues in the film industry. Similarly, Choi and Varian (2012) use Google search data to forecast automobile sales, travel planning, and consumer confidence. Our analysis highlights a pronounced effect on search terms linked with purchase intent, in line with previous findings that online searches often translate into offline sales. Thus, we propose that social media affects sales through online searches. Figure 2 illustrates the effect of the Twitter brand banter on sales.

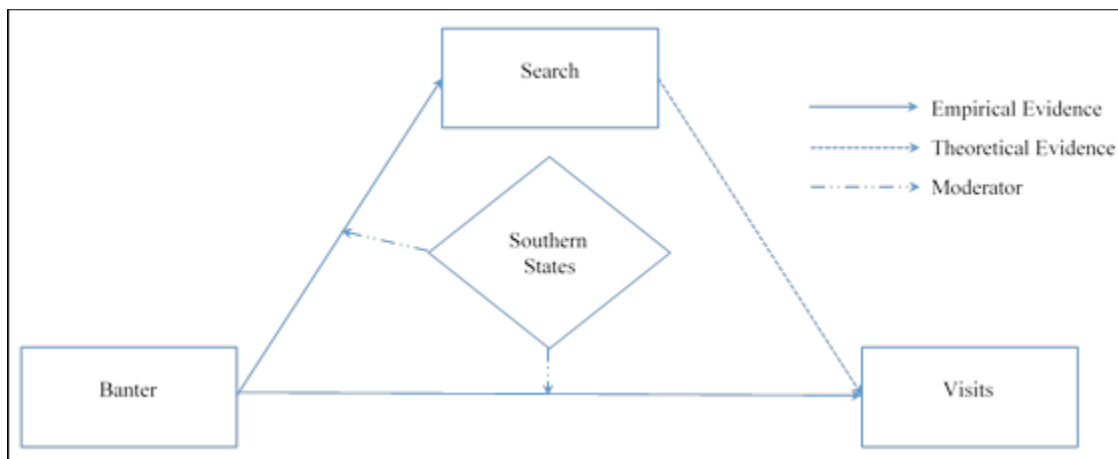


Figure 2. Twitter Banter to Visits: Mediation and Moderation

We further investigate the role of race as a moderator, specifically focusing on its amplification effects within specific regions of the United States. Fried chicken holds historical significance in the African American culture, particularly in the southern United States. Harris (2011) notes that African Americans, drawing from their culinary traditions, contributed to the evolution of Southern cuisine with fried chicken, rooted in African frying techniques. Similarly, Twitty (2017) emphasizes the pivotal roles of African

American history and culinary heritage in shaping Southern cooking, including the preparation of fried chicken. Miller (2013) highlights the evolution of soul food, stressing its African American origins and how the flavors of fried chicken resonate within African American communities, linking to ancestral heritage. Edge (2004) explores the cultural significance of fried chicken, especially in the South, where communal gatherings often feature this dish. Finally, Opie (2010) emphasizes how fried chicken, steeped in history, symbolizes resistance, resilience, and celebration within the African American community. The history of fried chicken intertwines with the narrative of African Americans and the southern United States, creating a culinary tapestry reflecting resilience, creativity, and cultural identity.

Popeyes, established in 1972 by New Orleans entrepreneur Al Copeland, strategically catered to African Americans at first. In a market largely dominated by Kentucky Fried Chicken, Copeland recognized the potential for success and introduced a spicier alternative marketed as “Cajun” (Chatelain, 2019). Popeyes chicken, combined with side dishes such as red beans and rice, resonated with many Black diners, offering a variety of spices rooted in African and Caribbean cuisines. Popeyes' use of the phrase “y'all looking thirsty” in its banter with Chick-fil-A and Wendy's further bolsters its connection with Southern culture. These expressions, familiar to Americans from southern states and particularly African Americans, align with Popeyes' Louisiana heritage. Furthermore, the influence of Black Twitter, which predominantly attracts African American users, significantly contributed to the banter's viral spread (Pearl, 2019). Thus, the role of race as a moderator in this study becomes crucial for understanding the heterogeneous effects of the banter. However, our data are at an aggregate level, which precludes us from analyzing the effects at an individual level. Therefore, we gauge the impact of race through an available proxy – southern states – which have a higher percentage of African American residents than northern states and a strong affiliation with the Popeyes brand, as per Census data. In southern states, where African Americans comprise 22% of the population, significantly higher than the 8.5% in other states, we anticipate the banter's effects on sales to be more pronounced than in the rest of the country.

METHODS

The overall aim in this section is to specify models that can identify the causal effects of a product launch and Twitter banter on the three brands involved. We use a fixed-effects regression model to infer (1) the direct effects on store visits and (2) the effects on Google search trends associated with keywords for Popeyes (mediation). We then identify the long-term effects of the product launch using a novel synthetic difference-in-differences (SDID) method, which is an advancement over the commonly used difference-in-differences (DID) and synthetic controls (SC) methods for such causal analysis.

Short-term Effects of the Twitter Banter

To infer the causal effect of the fast-food brands' banter on search trends and in-store visits, we used data from August 12, 2019, to August 25, 2019. As mentioned previously, the new chicken sandwich was introduced on August 12, 2019, and Chick-fil-A initiated the banter on August 19, 2019. As a result, we define the pre-banter period as data up until August 18, 2019, and the post-treatment period as data from August 19, 2019, to August 25, 2019. We restrict our analysis to two weeks because of the temporary withdrawal of the product from the market due to overwhelming demand (Morabito, 2019). To estimate the effect of the Twitter banter, we employ the following model to analyze store footfalls (visits) and Google Search trends:

$$(1) \quad Visits_{sd} = \beta_{0v} + \beta_{1v} * Post_{sd} + \sum_l \lambda_l * state_s^l + \sum_t \delta_t * day_d^t + \varepsilon_{sd},$$

where $Visits_{sd}$ represent the number of visits in a day (d) for a given state (s) in the two-week time frame, $Post_{sd}$ is a dummy variable denoting whether the observation is in the pre-treatment (before the banter but after the launch) or post-treatment (after the banter) period, λ_l and δ_t capture state and day fixed effects, respectively. By including these fixed effects, we control for the differences between states (the number of visits to stores in Texas might be different from that to stores in New York) and weekdays (Mondays might be different from Saturdays in terms of the number of store visits). Furthermore, Chick-fil-A stores are closed on Sundays. Thus, to ensure a fair comparison among the brands, we exclude Sunday data for Popeyes and Wendy's. Finally, β_{1v} the coefficient of interest captures the causal effect of the banter on the visits. We use the model (2) to analyze

whether the banter causes a surge in online search that, in turn, leads to higher visits (and sales):

$$(2) \quad Search_{sd} = \beta_{0s} + \beta_{1s} * Post_{sd} + \sum_l \lambda_l * state_s^l + \sum_t \delta_t * day_d^t + \varepsilon_{sd},$$

where $Search_{sd}$ is the online search volume associated with the keywords for each of the brands and coefficient β_{1s} measures the causal effect of the banter on search interest.

As discussed in the Mechanism section, Popeyes strategically caters to the African American community with its spicy fried chicken, an integral part of its cuisine. Moreover, the African American community played a significant role in making the banter go viral. We rely on the difference in proportions of the African American population in southern states (22%) versus the rest of the country (8.5%) to capture the moderating effects of the banter across different regions. Thus, we extend models (1) and (2) by adding an indicator variable for southern states. Here, $Southern_s$ takes the value 1 for southern states and 0 otherwise. We then interact it with the treatment indicator $Post_{sd}$:

$$(3) \quad Visits_{sd} = \beta_{0v} + \beta_{1v} * Post_{sd} + \beta_{2v} * Post_{sd} * Southern_s + \sum_l \lambda_l * state_s^l + \sum_t \delta_t * day_d^t + \varepsilon_{sd},$$

$$(4) \quad Search_{sd} = \beta_{0s} + \beta_{1s} * Post_{sd} + \beta_{2s} * Post_{sd} * Southern_s + \sum_l \lambda_l * state_s^l + \sum_t \delta_t * day_d^t + \varepsilon_{sd}$$

where coefficient β_{2v} (β_{2s}) captures the difference in visits (searches) between the southern and non-southern states.

Long-term Effects of Product Launch

To identify the long-term effects of the new product launch (the treatment), we need to predict what Popeyes' footfalls would be in the absence of the chicken sandwich launch, also called the “counterfactual outcome.” As we cannot observe Popeyes's outcomes in either the presence or absence of the launch, we rely on control units (in this case, restaurants that did not launch a new product) and a conditional independence assumption to identify the long-term treatment effect. This assumption suggests that the expected outcomes for the treated and control groups would have been the same without the treatment, conditional on their pre-treatment covariates and time-varying unit-specific unobserved confounders. Abadie et al. (2010) argue that units with similar outcome values in the pre-treatment period are also likely to have similar values for time-varying unobserved confounding factors. Although we can also use pre-treatment covariates, Doudchenko and Imbens (2016) advocate using only pre-treatment outcome

values of control units because of their higher predictive power. Thus, we use the pre-treatment outcomes of the control units to predict the counterfactuals for the treated unit under no treatment. If the unobserved unit-specific confounding factors were assumed to be constant, the treated and control outcomes would have evolved in parallel in the absence of treatment (used in DID). When the parallel trends assumption is invalid, we create a weighted combination of the control units (as done in SC) to balance the outcomes of the treated and control units in the pre-treatment period (see Abadie et al., 2010; Abadie & Gardeazabal, 2003). The SDID method (Arkhangelsky et al., 2021) builds on the SC method by including time weights that can remove bias and improve the precision of our estimates, as they help eliminate the periods that differ from the post-treatment periods. Given these advantages, we use SDID to measure the long-term causal effects of the product launch.

To build counterfactuals for Popeyes, we avoid control brands that sell similar food items to those sold at Popeyes (e.g., McDonald's); in that case, the new chicken sandwich launch could cause a substitution toward Popeyes. This situation would violate a key quasi-experimental requirement, the stable unit treatment values assumption, which states that the potential outcomes of other units should not vary with the treatment assigned to one unit (e.g., Popeyes). We therefore require the controls that generate counterfactuals for Popeyes to be brands unlikely to be affected by Popeyes' launch.

SDID Model : Consider a causal study based on observations of N units over T periods, with T_0 pre-treatment periods, with α_i as a unit-specific fixed effect; B_t as a time-specific fixed effect; and TR_{it} as a treatment indicator variable for the period of the study, with $TR_{it} = 0$ for the control units and $TR_{it} = 1$ for the treated units in the post-treatment periods. Finally, let the parameter θ be the causal effect of the observed treatment. SDID uses a weighted average of the available control units to approximate the outcome of the treated unit in the pre-treatment period (Abadie & Gardeazabal, 2003). It estimates weights (w_i) to match the outcomes of the treated unit in the pre-treatment periods (similar to SC). SDID (unlike SC) balances pre-exposure and post-exposure periods by assigning time weights (λ_t) to the pre-treatment periods. These additional weights help remove bias and improve precision by eliminating the roles of periods very different from the post-treatment periods. SDID allows for an intercept term, which means that the

weights no longer need to perfectly match the unexposed pre-trends to the exposed ones, as in SC, where $w_0 = 0$. In situations with large numbers of control units compared with pre-treatment periods, Doudchenko and Imbens (2016) propose a regularization method using elastic nets that imposes a penalty on the coefficients to ensure the uniqueness of weights. The method then derives estimates by minimizing the following constrained expression:

$$(5) \quad \sum_{t=1}^{t=T} \sum_{i=1}^{i=N} (Y_{it} - u - \alpha_i - B_t - TR_{it}\theta)^2 w_i \lambda_t,$$

Subject to $\sum w_i = 1, \sum \lambda_t = 1,$

$w_i \geq 0 \forall i, w_0 \neq 0, \lambda_t \geq 0 \forall t, \lambda_0 \neq 0.$

Using both unit and time-specific weights, SDID makes the two-way fixed effects regression “local.” A detailed comparison among DID, SC, and SDID is available in Appendix W1. We report the long-term causal effects of the banter using the SDID method and provide support for the significance of estimates using a robust placebo variance procedure (for details, see Arkhangelsky et al., 2021). We also show the heterogeneity in long-term effects in southern versus non-southern states.

RESULTS

Short-term Effect of Twitter Banter on Visits and Online Search

Tweet volume associated with Popeyes, Chick-fil-A, and Wendy’s increased by 2111%, 1036%, and 920%, respectively, post banter, consistent with the findings of Greene et al. (2022). Appendix W2 provides the engagement results. As we are interested in the impact on offline sales, in Table 1 we report the total tracked visits per store in the pre-banter week. For example, in the case of Popeyes, we track 12.96 daily visits per store using smartphone location tracking (approximately 10% of total visits). Similarly, we report the search interest in each brand daily. This process allows us to compare the percentage change in visits (panel A) and search (panel B) post banter. Popeyes benefited the most from the banter, with a nearly 54% (7 additional tracked visits per store) increase in in-store traffic over the previous week (see panel A, model 1). Percentage change was calculated using the pre-treatment period values in Table 1. The two

incumbents, Chick-fil-A (5%, panel A, model 3) and Wendy's (-3%, panel A, model 5), were relatively unaffected from the banter.

The banter also spills over onto online search, which led to an increase in offline sales. The results from the online search are consistent with those from store visits. Online search increased by 426% (panel B, model 1) for Popeyes in the week following the banter. Chick-fil-A experienced no significant change in online search, and Wendy's search showed a small drop (12%) in the week following the banter (panel B, models 3 and 5, respectively). The effect on store visits was 58% higher in the southern (vs. non-southern) states for Popeyes (panel A, model 2). Similarly, online search activity associated with Popeyes was 161% higher in the southern (vs. non-southern) states (panel B, model 2).

In summary, these results imply that Popeyes benefited more from the banter than the other two fast-food brands. It gained more value than its rivals and even more so in the southern states, indicating the roles of brand heritage.

Table 1
Short-term Effects

A. Effect on Visits

<i>DV: Visits</i>	<i>Popeyes</i>		<i>Chick-fil-A</i>		<i>Wendy's</i>	
	1	2	3	4	5	6
Main effect	7.002*** (1.27)	6.6178*** (1.24)	4.079*** (0.62)	3.085** (1.04)	-0.567*** (0.11)	-0.259 (0.19)
Southern states effect		3.603*** (0.82)		3.892 (2.89)		-1.699*** (0.31)
<i>State fixed effects</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
<i>Time fixed effects</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
<i>Pretreatment daily Average values</i>	12.96	12.96	77.21	77.21	19.65	19.65
<i>N</i>	564	564	564	564	564	564
<i>R²</i>	0.8	0.82	0.95	0.95	0.88	0.88

B. Effect on Online Search

<i>DV: Online Search</i>	<i>Popeyes</i>		<i>Chick-fil-A</i>		<i>Wendy's</i>	
	1	2	3	4	5	6
Main effect	0.124*** (0.028)	0.085*** (0.02)	-0.002 (0.01)	-0.01 (0.01)	-0.041*** (0.01)	-0.039*** (0.009)
Southern states effect		0.137** (0.03)		0.04 (0.02)		-0.005 (0.011)
<i>State fixed effects</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
<i>Time fixed effects</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
<i>Pretreatment daily Average values</i>	0.029	0.029	0.19	0.19	0.33	0.33
<i>N</i>	700	700	700	700	700	700
<i>R²</i>	0.62	0.67	0.63	0.63	0.74	0.74

Notes: Standard errors are in parentheses. DV stands for dependent variable. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Long-term Effect of Product Launch on Visits

Table 2 reports the long-term effects of the product launch on visits and unique visitors for Popeyes. Visits are a measure of revenue, while unique visitors suggest an impact on new customer acquisition. Using a window from the post-product launch on August 12, 2019, to February 28, 2020, we observe a 29.5% increase in store visits. This suggests that Popeyes gained approximately 30% additional sales consistently for at least six months after the new product launch. Most of the additional visits came from new customers, with a 32.4% increase in the number of unique visitors. This result shows that the brand attracted new customers, which can be difficult, especially in the fast-food industry, in which consumers may have already-established preferences for the incumbent brands in a category. The role of race as our moderator is also evident in the long-term effects. The increase in the number of visits was 41% higher in the southern states than in the non-southern states. Similarly, the increase in the number of unique visitors was 38% higher than that in the southern states.

Table 2
Long-term Effects Using SDID

SDID effects	Visits	Visitors
Rest of United States	25.53	24.10
Southern states	36.03	33.31
Average weekly values in the pre-treatment period	91.08	76.29

Notes: We calculate the SDID effects separately for each state.

Robustness Checks

We find support (see Appendix W3) for the exogeneity of the banter event from the perspectives of the category entrant, Popeyes, and the incumbents (Chick-fil-A and Wendy's). We conclude that the banter was an unplanned event and not a strategic sequence of moves by the three rivals. In addition, we offer robustness checks (see Appendix W4) for our point estimates of SDID with a placebo-variance algorithm (Arkhangelsky et al., 2021) to ensure that the long-term effects are statistically significant. Next, we analyze whether any competitive nationwide brand suffered from a loss of foot traffic through substitution because of the newly launched chicken sandwich (see Appendix W5). We find no evidence that this launch causally affected other major nationwide brands.

DISCUSSION

Brand-to-brand banter on social media can boost social media engagement, but their real market economic impact remains ambiguous. In this study, we examine the effects of online banter among three prominent fast-food brands after the launch of a chicken sandwich by Popeyes. Engagement, measured by tweet volume, notably surged for all three brands involved in the banter. However, Popeyes experienced a higher number of store visits than Chick-fil-A and Wendy's. Therefore, we treated online search as a mechanism for the effects on store visits and observed a 426% increase in Google search activity for Popeyes. Conversely, similar effects on online search for the incumbents were not evident, mirroring the pattern observed in in-store visits.

In addition, we quantify the long-term economic effects of the new chicken sandwich launch on the Popeyes brand. We use the SDID method, which has notable advantages over popular methods (i.e., SC and DID), to show that the launch increased visits and

visitors to Popeyes stores by 29.5% and 32.4%, respectively. Thus, Popeyes was able to acquire a new customer base with this successful product launch. However, we found no evidence of a direct substitution from any major nationwide brand to Popeyes.

Popeyes' southern heritage and its resonance with African American customers, evident in its Twitter persona featuring southern/African American vernacular, captivated attention from Black Twitter, contributing to the banter's viral spread. Using the southern states indicator as a proxy for the African American population due to the absence of individual-level data, we observed increased search interest and foot traffic for Popeyes in these states. This finding suggests that race influenced the impact of Twitter banter.

The findings indicate that brand-to-brand conversations on social media can yield economic benefits for rival brands, though unintended repercussions might emerge for those initiating online banter. Consequently, social media managers should exercise caution in instigating banter on Twitter, despite its potential to spur substantial engagement growth. If they do opt to engage in banter, they should (1) strategize ways to infuse humor rather than using disparaging tones and (2) refrain from interacting with rivals boasting newly launched products. Otherwise, negative comparisons on social media, unlike in offline settings, could swiftly give rise to unearned publicity and bolster sales for rivals.

Limitations and Future Research

This study investigates online banter that notably increased the sales of the focal brand during the launch of a new product. The spontaneous nature of this dialogue had a positive impact on sales, examined through quasi-experimental analysis. However, this research has certain limitations that warrant attention in future studies on this topic. The aggregated store-level data restricted the observation of individual behavioral changes among customers. Future research could address this by collecting individual-level data, allowing for a more comprehensive examination of the underlying mechanisms driving the observed changes. In this study, the southern states, serving as a proxy for African American population, known for their loyalty to Popeyes, moderated the impact on sales. Access to individual-level data in the future could facilitate investigating how brand interactions affect various demographics that also differ in social media usage and access.

Future research could further analyze variations in impact of banter across industries, the temporal aspects of banter, and the perceived intensity of rivalry among brands. The rapid dissemination of information across the world within hours makes the phenomenon of social media banter particularly intriguing. Brands and their social media strategists stand to gain significant insight from robust academic scrutiny of such banter in the years ahead.

Overall, investigating brand banter on social media remains a promising research avenue. Exploring its effects in different industry contexts, examining the optimal timing of engagement, and understanding the varying perceptions of rival brands could offer valuable insights for the social media managers. Moreover, continued scholarly attention to this evolving phenomenon would benefit brands aiming to navigate and capitalize on the landscape of social media interactions.

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APPENDIX

Appendix W1: Comparison Between DID, SC & SDID

Table T2: Comparison of DID, SC, and SDID

	DID	SC	SDID
Weights assigned to N controls	Equal weights for each control (1/N)	Unequal weights, $\sum_{i=1}^N w_i = 1$,	Unequal weights, $\sum_{i=1}^N w_i = 1$
Regression estimation	Two-way fixed effect (Unit fixed effects and time fixed effects)	Omits unit-specific fixed effects	Two-way fixed effect (Unit fixed effects and time fixed effects)
Intercept for unit-specific weights	-	Systematic differences between treated unit and synthetic controls not allowed, i.e., $w_0 = 0$	Systematic differences between treated unit and synthetic controls allowed. $w_0 \neq 0$
Time-specific weights	-	No	Yes
Regularization term in weights calculation	-	No	Yes

Appendix W2: Data (Twitter Engagement)

We use Twitter Search API, a developer interface to query keywords linked to the banter and retrieve hourly volume of tweets associated with them. We capture tweet count for keywords associated with the three chicken category rivals who participated in the banter. For the new entrant — Popeyes, we use keywords such as ‘popeyes’, ‘popeyeschickensandwich’, ‘#popeyes’ and ‘#popeyeschickensandwich’ to retrieve the tweet count associated with each keyword. We also query the API service for keywords related to the incumbents, Chick-fil-A (specifically, ‘chickfila’, ‘chick-fil-a’, ‘#chickfila’, ‘#chick-fil-a’) and Wendy’s (‘#wendys’, ‘#wendy’s’, ‘wendys’, ‘wendy’s’). The resulting data quantifies the effect of the banter on Twitter engagement for the three brands (see summary in Table T1)

Table T1: Evidence for Banter Effect on Twitter Engagement

Average Hourly Engagement	Chick-fil-A	Popeyes	Wendy’s
72 hours prior to banter	748.49	726.93	819.04
72 hours after banter	8506.02	16069.23	8352.46
Change	1036.42%	2110.57%	919.78%

Appendix W3: Robustness check 1 (Exogeneity of Twitter Brand Banter)

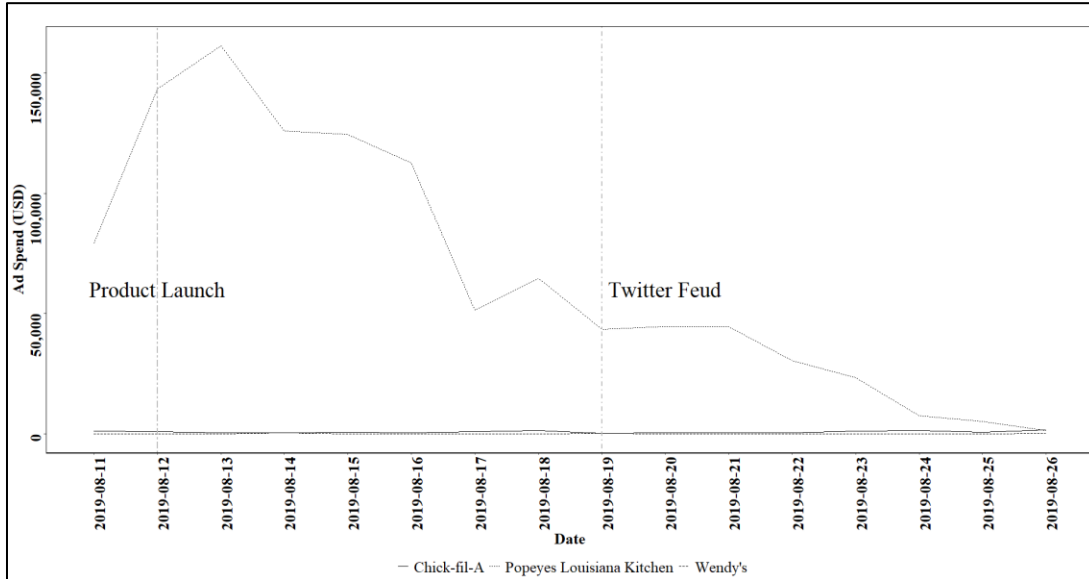
In the paper, we argue that Popeyes’ actions during the brand banter were exogenous; for these were merely quick retorts (Ngwakwe, 2019) to the tweets posted by the category incumbents, Chick-fil-A and Wendy’s. But it is also important to show the Twitter banter for the incumbents were also unplanned, and not strategic actions to gain publicity. We do this by noting the sequence and speed (hours) with which the incumbents joined the brand-to-brand conversation and use secondary data to show it was unlikely they had existing plans to use the Twitter banter to gain awareness for their Chicken sandwiches.

From evidence of the banter, we first notice that Wendy’s did not initiate a conversation with the Popeyes brand on their own but responded to the initial humorous exchange between Popeyes and Chick-fil-A within a span of hours (on the day of the exchange, August 19, 2019). This suggests that the response by Wendy’s was an

unplanned move to join the banter for their own benefit. In other words, Wendy's was not being strategic in their response.

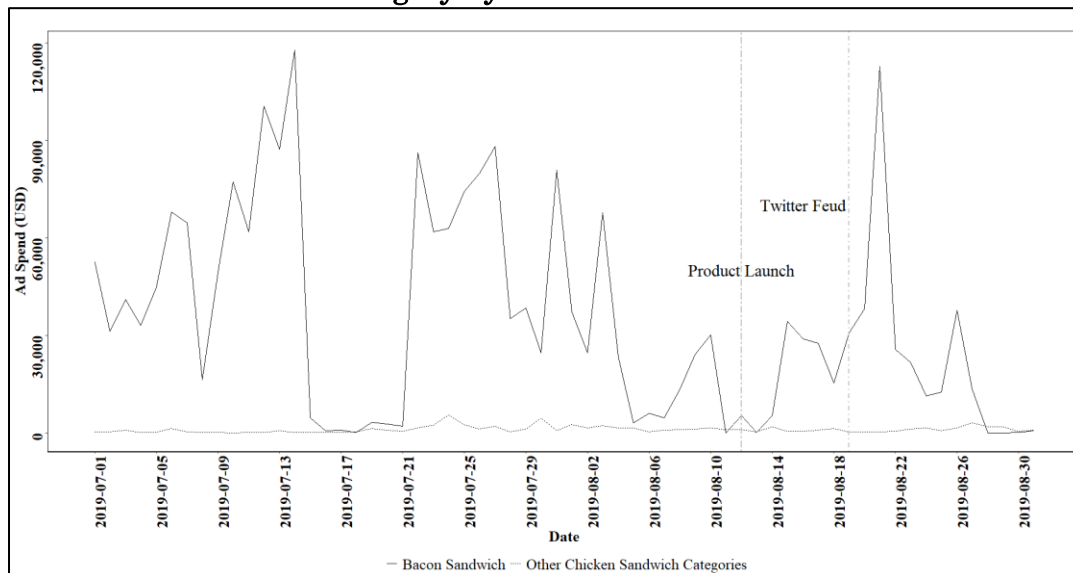
Nonetheless, Chick-fil-A (who initiated the first brand-to-brand exchange) could have been strategic in their decision to begin the banter in response to the new product launch, while employing other promotional elements such as advertising to *support their argument in the exchange*. We therefore looked at the nationwide advertising spend (source — Nielsen's Ad Intel data) by Chick-fil-A and the other two brands between August 11, 2019, and August 26, 2019. Figures F1, F2 and F3 put Chick-fil-A's overall advertising strategy during this period into perspective. First, figure F1 shows that Chick-fil-A's ad spend in the chicken sandwich category was *merely \$841* per day, which is about *1.2%* of the amount spent by Popeyes (the new entrant) during the same period. Similarly, figure F2 shows that Chick-fil-A spent a small amount promoting their chicken sandwich relative to the amount spent on their smokehouse-BBQ bacon sandwich, on which they spent more than \$25,000 per day. We thus argue the incumbent, Chick-fil-A was not aiming to promote the chicken sandwich category when they initiated the brand banter. Moreover, figure F3 showed that the Chick-fil-A ad spend on all other categories was much lower than that of the new entrant, Popeyes' (about 21%), while both brands had similar number of stores across the United States (2448 and 2269, respectively) As a result, it is reasonable to characterize the initial tweet from Chick-fil-A as an impulsive decision not one backed by any strategic forethought as seen from the ad data. Chick-fil-A's social media team took a seemingly harmless approach to subtly remind the Twitter audience that its own product was the *original in the category*. But we find no evidence to suggest that Chick-fil-A planned the date and time to respond strategically to Popeyes' new product launch.

Figure F1: Advertising Spend on Chicken Sandwich Category by Rival Brands

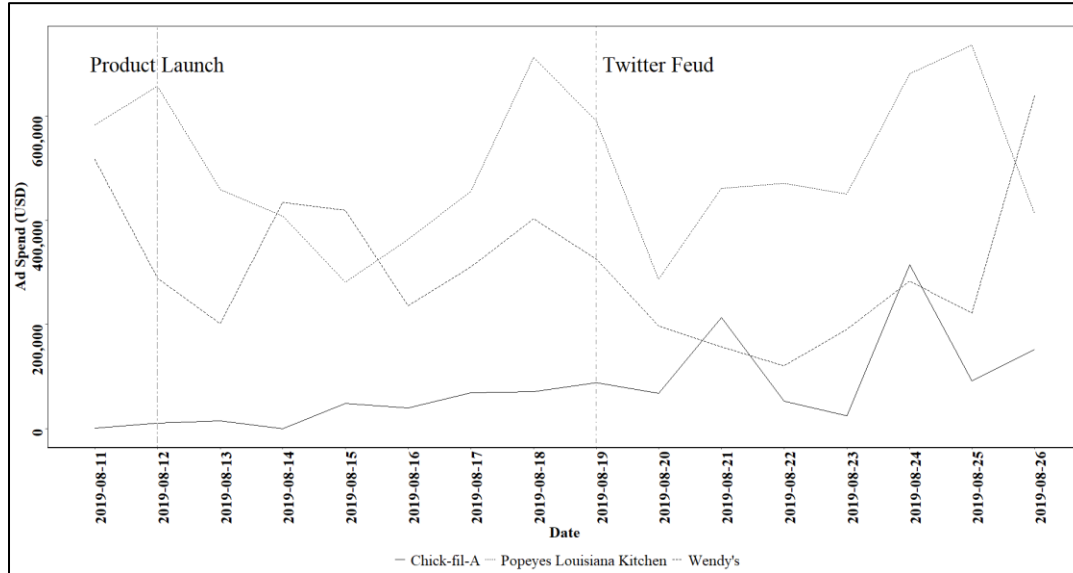


Notes: Chick-fil-A and Wendy’s spent very little on the chicken sandwich category in comparison to Popeyes. This is evident from the flat lines at the bottom of the graph. The average daily spend by Chick-fil-A during the two-week observation period was \$841. Wendy’s spent about \$48 per day in the same period. In comparison, Popeyes spent about \$66,456, on average, during the same period.

Figure F2: Advertising Spend on Bacon Sandwich Category and Chicken Sandwich Category by Chick-fil-A Brand



Notes: During July 2019 and August 2019 Chick-fil-A spent \$34,619 per day on Bacon Sandwich category. During the same period, Chick-fil-A spent about \$1,039 per day on the rest of the Chicken Sandwich products. Between August 11, 2019, and August 26, 2019, Chick-fil-A spent about \$25,443 on Bacon Sandwich.

Figure F3: Advertising Spend on All Other Categories by Three Rival Brands

Notes: The average daily spend by Chick-fil-A during the two-week observation period was about \$103,928. On average, Wendy's spent about \$309,025 in the same period. Daily average spend for Popeyes was about \$500,597 during the same period.

Appendix W4: Robustness Check 2 (Statistical Significance)

Table T3 reports the confidence interval for SDID treatment effects across the visits and visitors. We generate these intervals using the placebo-variance procedure discussed by Arkhangelsky et al. (2021). The algorithm is applicable in quasi-experimental studies with one treated unit, and relies upon placebo evaluations, which are common in the SC literature (Abadie, Diamond, and Hainmueller, 2010, 2015). The main idea behind these evaluations is to consider the behavior of the SC estimates when one replaces the unit that received treatment with those units that remain untreated. We do this to estimate the significance of our treatment effect by ruling out the possibility that the point estimate of the treatment effect arose by chance. The procedure ultimately generates 95% confidence intervals for the treatment from the following formula: (*Treatment Effect* – $Z_{1-\alpha/2}\sqrt{\hat{V}_t}$, *Treatment Effect* + $Z_{1-\alpha/2}\sqrt{\hat{V}_t}$), where the variance \hat{V}_t is obtained using the placebo estimator ($Z \sim N(0,1), \alpha = 5\%$).

Table T3: Confidence Intervals for the Treatment Effects Using Placebo Tests

Metrics	SDID — Treatment Effect	Placebo Treatment Variance	Standard Error	Confidence Interval
Visits	26.90	19.44	4.41	[18.08, 35.72]
Visitors	24.74	12.70	3.56	[17.61, 31.87]

Appendix W5: Robustness Check 3 (Substitution Effects)

Popeyes' new product launch resulted in increased visits and visitors to their stores. We investigate the possibility that these came via substitution from rivals by determining if any leading, nationwide fried chicken/burger chain had a significant decrease in visits around the time Popeyes launched their new product. We use the same variance estimator calculated from the placebo treatment for visits and visitors. As Table T4 shows, all treatment effects on visits and visitors are insignificant, which suggest no major restaurant chain lost traffic to Popeyes because of the latter's spicy chicken sandwich launch. Chick-fil-A has seen enormous growth in their business from 2018 to 2020. Their average visits per week grew from 354 to 520 in this period. In the SDID model, we can only be confident of the treatment effect if the counterfactual nicely matches the actual outcomes in pre-treatment periods. Because it is unable to adequately match Chick-fil-A's business in the pre-treatment period, any estimate of treatment effect is not reliable.

Table T4: Possible Substitution from Burger/Fried Chicken Chains to Popeyes

Burger/Fried Chicken Restaurant	Visits-Treatment Effect	Visitors-Treatment Effect	CI Visits	CI Visitors
Arby's	-2.722	-2.870	[-11.54,6.1]	[-10.4,2.6]
Burger King	-1.793	-0.671	[-10.61,7.02]	[-7.8,6.46]
Carl's Jr.	-2.659	-2.301	[-11.48,6.16]	[-9.43,4.83]
Champs Chicken	3.904	2.926	[-4.91,12.72]	[-4.2,10.06]
Church's Chicken	-3.873	-2.295	[-12.69,4.94]	[-9.42,4.83]
Five Guys	0.289	-0.062	[-8.53,9.11]	[-7.19,7.07]
Hardee's	-3.481	-3.438	[-12.3,5.34]	[-10.57,3.69]
Jack in the Box	-2.625	-1.264	[-11.44,6.19]	[-8.39,5.86]
KFC	-0.038	0.011	[-8.86,8.78]	[-7.12,7.14]
Krispy Krunchy Chicken	0.969	0.661	[-7.85,9.79]	[-6.47,7.79]
McAlister's Deli	0.787	1.457	[-8.03,9.6]	[-5.67,8.59]
McDonald's	0.185	2.308	[-8.63,9.0]	[-4.82,9.44]
Rally's Drive-In Restaurants	-1.963	-1.098	[-10.78,6.85]	[-8.23,6.03]
Smashburger	-0.524	-1.183	[-9.34,8.29]	[-8.31,5.95]
Sonic	4.712	4.128	[-4.11,13.53]	[-3.0,11.26]
Wendy's	2.152	3.918	[-6.67,10.97]	[-3.21,11.05]
Zaxby's	2.337	1.191	[-6.48,11.15]	[-5.94,8.32]

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